

FIG.1

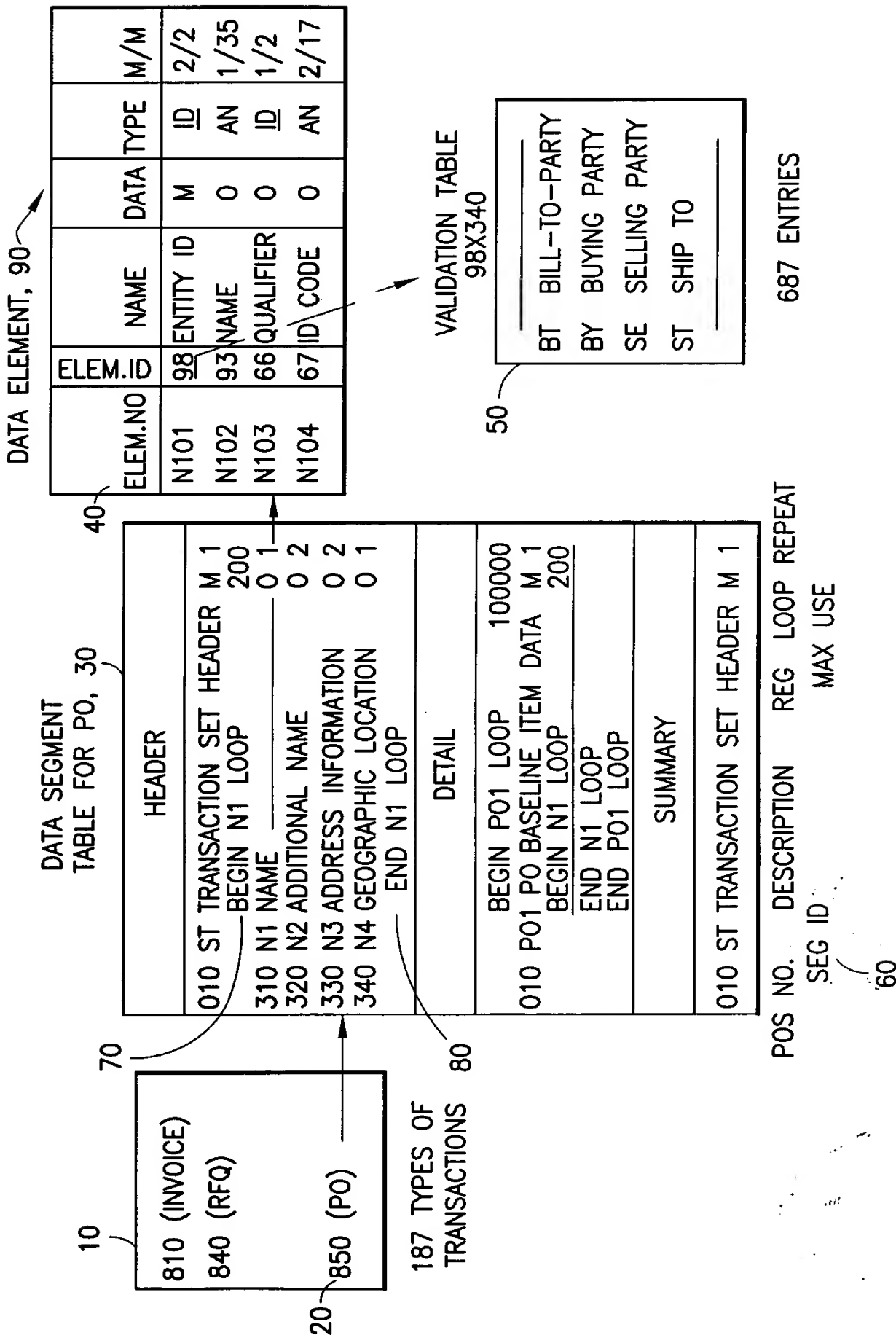


FIG.2A

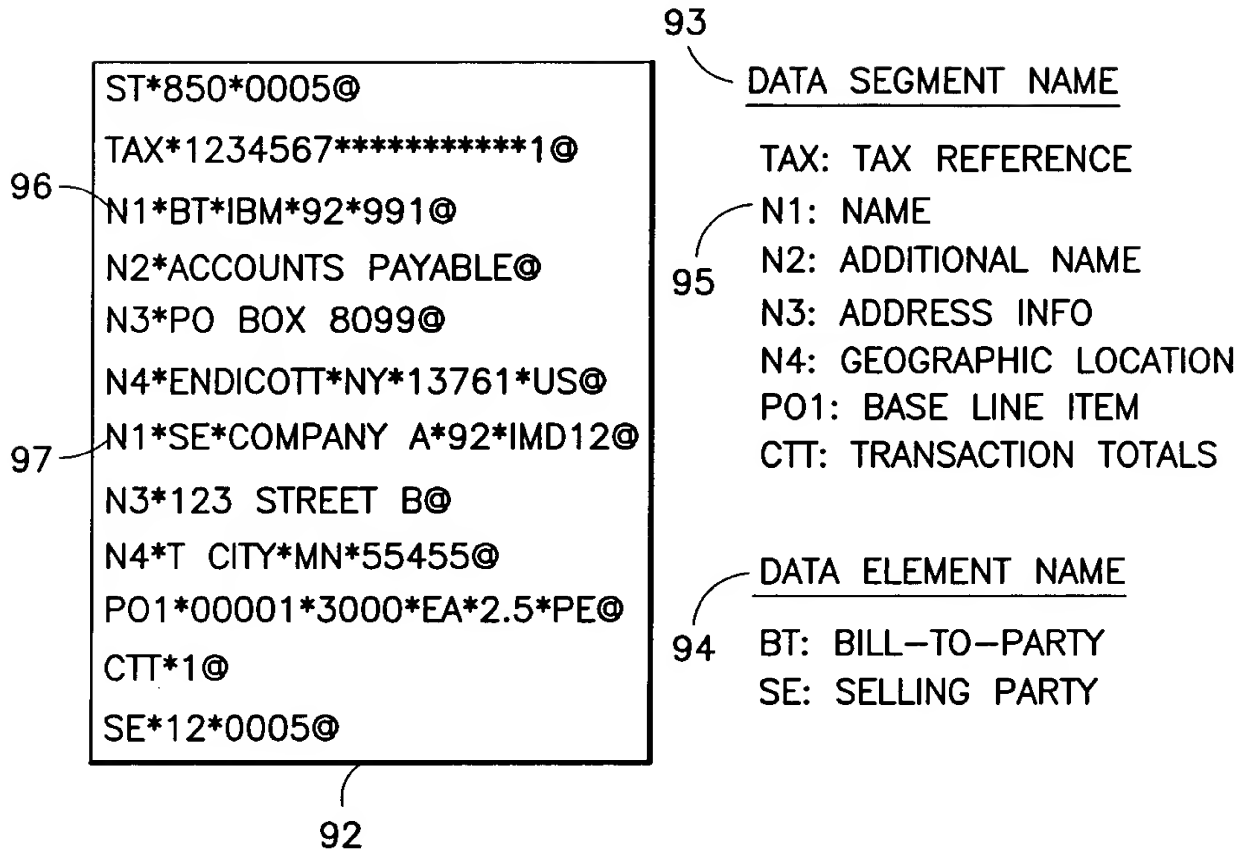


FIG.2B

```
<!DOCTYPE transactionSet [  
    200  
    )  
<!ELEMENT transactionSet (name, (loop|segment)*)>  
<!ATTLIST transactionSet  
    code CDATA #REQUIRED  
    version CDATA #REQUIRED  
    standard (X12 | EDIFACT) "X12"  
>  
    210  
    )  
<!ELEMENT loop ((loop | segment)*)>  
<!ATTLIST loop  
    code CDATA #REQUIRED  
>  
    220  
    )  
<!ELEMENT segment (name, element*)>  
<!ATTLIST segment  
    code CDATA #REQUIRED  
>  
    230  
    )  
<!ELEMENT element (name, value)>  
<!ATTLIST element  
    code CDATA #REQUIRED  
>  
    240  
    )  
<!ELEMENT name (#PCDATA)>  
    250  
    )  
<!ELEMENT value (#PCDATA)>  
<!ATTLIST value  
    code CDATA #REQUIRED  
>  
>  
>
```

FIG.2C

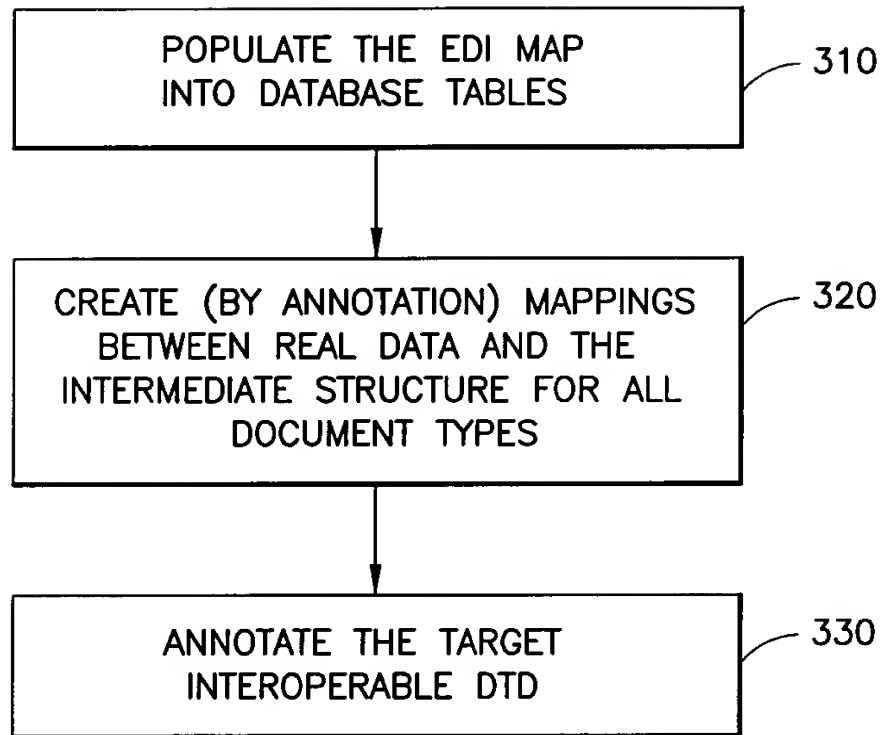


FIG.3

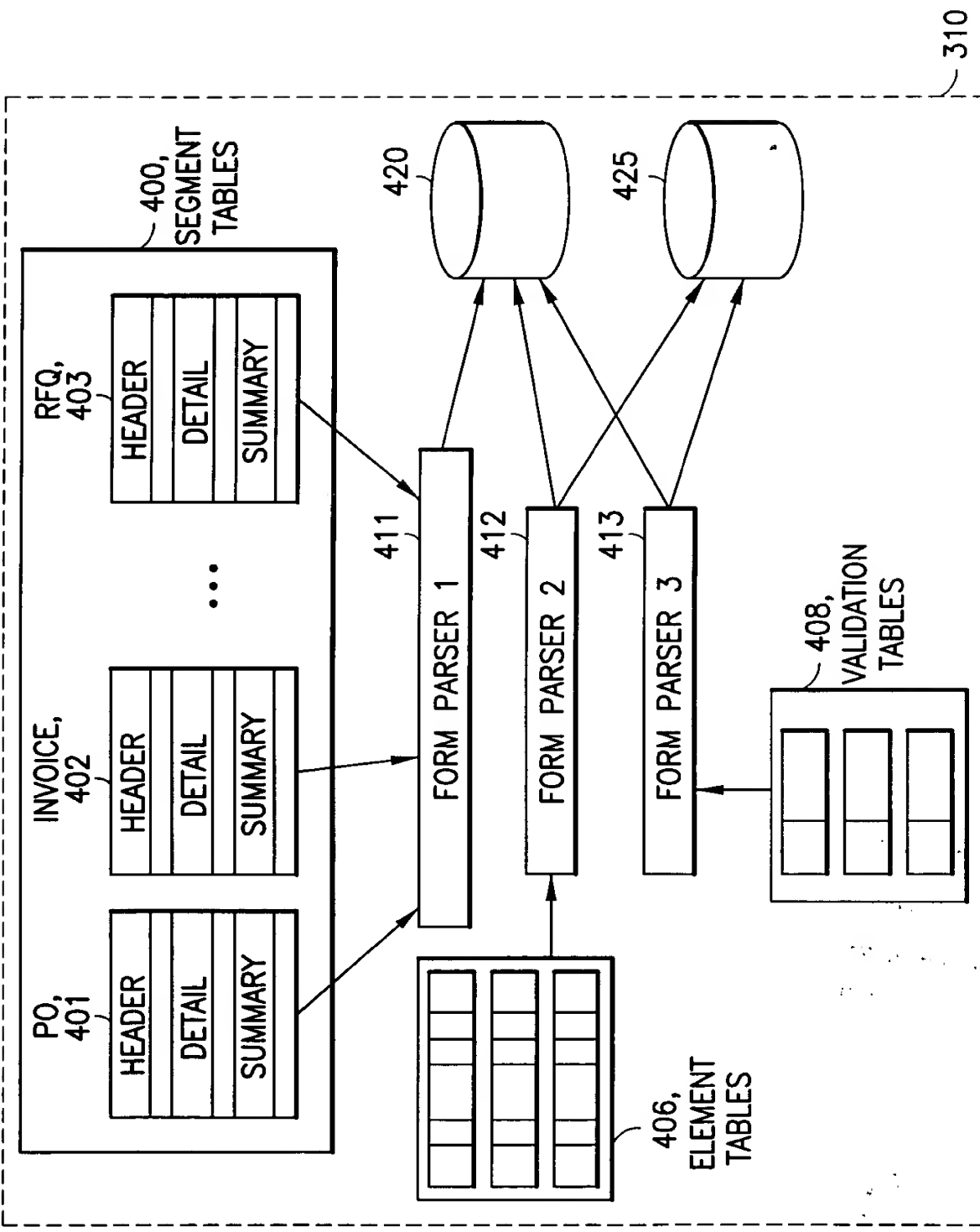


FIG. 4A

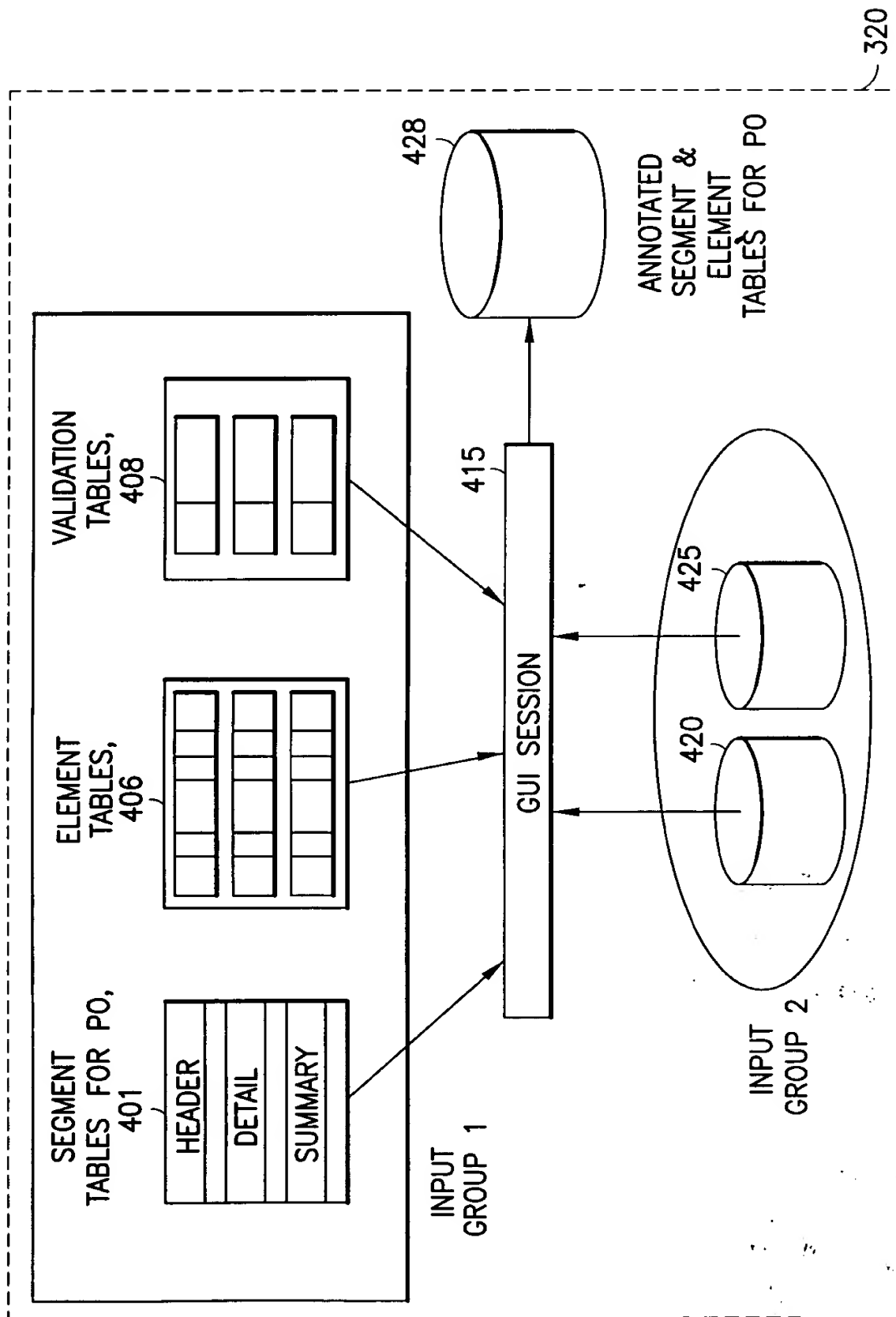


FIG. 4B

```

<!DOCTYPE transactionSet [
    450
    <!-- 460
    <!ELEMENT transactionSet (name:: w:=<getDocumentType(in1)>,
        loop::p:=<x.code>|segment::p:=<x.code>) :x.choice*
        ::x:=SQL("SELECT" FROM EDI WHERE map='$in1'
        ORDER BY pos"))>::dummy:=<initValue(in0)> 456
    <!ATTLIST transactionSet
        code CDATA #REQUIRED: getDocumentNumber(in1)
        version CDATA #REQUIRED:"004010" 459
        standard (X12 | EDIFACT) "X12"
    > 451
    <!-- 457
    <!ELEMENT loop ((loop::p:=<concat(p,"@", x.code)> |
        segment::p:=<concat(p,"@", x.code)>): x.choice*
        ::x:=SQL("SELECT" FROM EDI WHERE map='$x.code'
        ORDER BY pos"))>
    <!ATTLIST loop
        code CDATA #REQUIRED: x.name
    > 452
    <!--
    <!ELEMENT segment (name::w:=<x.name>,
        element*::y:=row(EDI, <map>, <x.code>)))>
    <!ATTLIST segment
        code CDATA #REQUIRED: x.code
    > 453
    <!--
    <!ELEMENT element (name::w:=<y.name>, value)>
    <!ATTLIST element
        code CDATA #REQUIRED: y.code
    > 454
    <!--
    <!ELEMENT name (#PCDATA:w)>
        455
    <!-- 474
    <!ELEMENT value (#PCDATA: value4Element(val, y.code, y.type)>
        ::val:=<getEDI Value(y.code, p)>
        470
    <!ATTLIST value
        code CDATA #IMPLIED:id4Element(val, y.type)
    > 472
]>

```

FIG.4C

| 500 MAP | | 502 CODE | 504 POS | 506 CHOICE | 508 TYPE |
|------------|--------------|--------------|------------|---------------|-----------------------------|
| | | | | | 510 NAME |
| 420 | TS850 | ST | 0010 | SEGMENT | TRANSACTION SET HEADER |
| | TS850 | BEG | 0020 | SEGMENT | BEGINNING SEGMENT FOR PO |
| | TS850 | REF | 0050 | SEGMENT | REFERENCE NUMBERS |
| | TS850 | LOOP_N1 | 0301 | LOOP | N1 |
| | TS850 | LOOP_PO 1 | 1010 | LOOP | PO1 |
| | TS850 | CTT | 2010 | SEGMENT | TRANSACTION TOTALS |
| | TS850 | SE | 2030 | SEGMENT | TRANSACTION SET TRAILER |
| | LOOP_N1 | N1 | 0310 | SEGMENT | NAME |
| | LOOP_N1 | N2 | 0320 | SEGMENT | ADDITIONAL NAME INFORMATION |
| | LOOP_N1 | N3 | 0330 | SEGMENT | ADDRESS INFORMATION |
| | LOOP_N1 | N4 | 0340 | SEGMENT | GEOGRAPHIC LOCATION |
| | LOOP_PO 1 | PO1 | 1010 | SEGMENT | BASELINE ITEM DATA |
| | LOOP_PO 1 | LOOP_PID | 1050 | LOOP | PID |
| | LOOP_PID | PID | 1050 | SEGMENT | PRODUCT/ITEM DESCRIPTION |
| 515 | ST | 143 | | ELEMENT | ID |
| | ST | 329 | | ELEMENT | A N |
| | N1 | 98 | | ELEMENT | ID |
| | N1 | 93 | | ELEMENT | A N |
| | N1 | 66 | | ELEMENT | ID |
| | N1 | 67 | | ELEMENT | A N |
| 516 | | 517 | | 518 | |

FIG.5A

| ELEMENT ID | CODE | VALUE | 425 |
|---------------|------|--|---------------|
| 143 | 810 | X12 INVOICE | |
| 143 | 850 | X12 PURCHASE ORDER | |
| 530 | 98 | BT | BILL-TO-PARTY |
| 531 | 98 | BY | BUYING PARTY |
| 532 | 98 | SE | SELLING PARTY |
| 533 | 98 | ST | SHIP TO |
| 66 | 1 | D-U-N-S NUMBER, DUN & BRADSTREET | |
| 66 | 8 | VENDOR UPS CODE | |
| 66 | 9 | D-U-N-S+4, D-U-N-S NUMBER WITH 4 CHARACTER SUFFIX | |
| 66 | 92 | ASSIGNED BY BUYER OR BUYER'S AGENT | |

FIG.5B

FIG. 6A

| 610 | 600 | 602 | 604 | 650 | 606 | 608 |
|-------|-------------------------|--------|---------------------------------|------------------------|------------------|-------|
| LEVEL | SEGMENT ELEMENT/CODE | REPEAT | ANNOTATION | DESCRIPTION | ST | LABEL |
| 1 | ST | | x:=row(PO, poid, in0) | TRANSACTION SET HEADER | ST | 653 |
| 2 | ST01/143 | | "850" 628 | ID CODE | ST@143 | |
| 2 | ST02/329 | | in0 | CONTROL NUMBER | ST@329 | |
| 1 | LOOP N1 | * | y:=row(company, coid, x.buyer) | N1/BUYER | LOOP_N1 | |
| 2 | N1 | | 621 630 | NAME | LOOP_N1@N1 | |
| 3 | N101/98 | | "BY" | ENTITY ID | LOOP_N1@N1@98 | |
| 3 | N102/93 | | y.name | NAME | LOOP_N1@N1@93 | |
| 2 | N4 | | 629 | GEOGRAPHIC LOCATION | LOOP_N1@N4 | |
| 3 | N402/156 | | y.addr. | STATE | LOOP_N1@N4@156 | |
| 1 | LOOP_N1 | * | y:=row(company, coid, x.seller) | N1/SELLER | LOOP_N1 | |
| 2 | N1 | | 623 635 | NAME | LOOP_N1@N1 | |
| 3 | N101/98 | | "SE" | ENTITY ID | LOOP_N1@N1@98 | |
| 3 | N102/93 | | y.name | NAME | LOOP_N1@N1@93 | |
| 2 | N4 | | | GEOGRAPHIC LOCATION | LOOP_N1@N4 | |
| 3 | N402/156 | | y.addr. | STATE | LOOP_N1@N4@156 | |
| 1 | LOOP_P01 | * | z:=row(lineitem, poid, in0) | P01/LINE ITEM INFO | LOOP_P01 | |
| 2 | P01 | | 640 | BASE LINE ITEM | LOOP_P01@P01 | |
| 3 | P0101/350 | | z.prodid | ID | LOOP_P01@P01@350 | |
| 3 | P0102/330 | | "1" 642 | QUANTITY | LOOP_P01@P01@330 | |

| | | | | | |
|---|-----------|---|-----------------------------------|--------------------------|---------------------------|
| | | | | | |
| 3 | P0104/212 | | z.amount | | LOOP_P01@P01@212 |
| 2 | LOOP_PID | * | w:=row(product, prodid, z.prodid) | PID/DESCRIPTION | LOOP_P01@LOOP_PID |
| 3 | PID | | | PRODUCT/ITEM DESCRIPTION | LOOP_P01@LOOP_PID@PID |
| 4 | PID01/349 | | "F" | ITEM DESCRIPTION TYPE | LOOP_P01@LOOP_PID@PID@349 |
| 4 | PID05/352 | | w.name | DESCRIPTION | LOOP_P01@LOOP_PID@PID@352 |

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FIG.6B

| |
|--------|
| FIG.6A |
| FIG.6B |

FIG.6

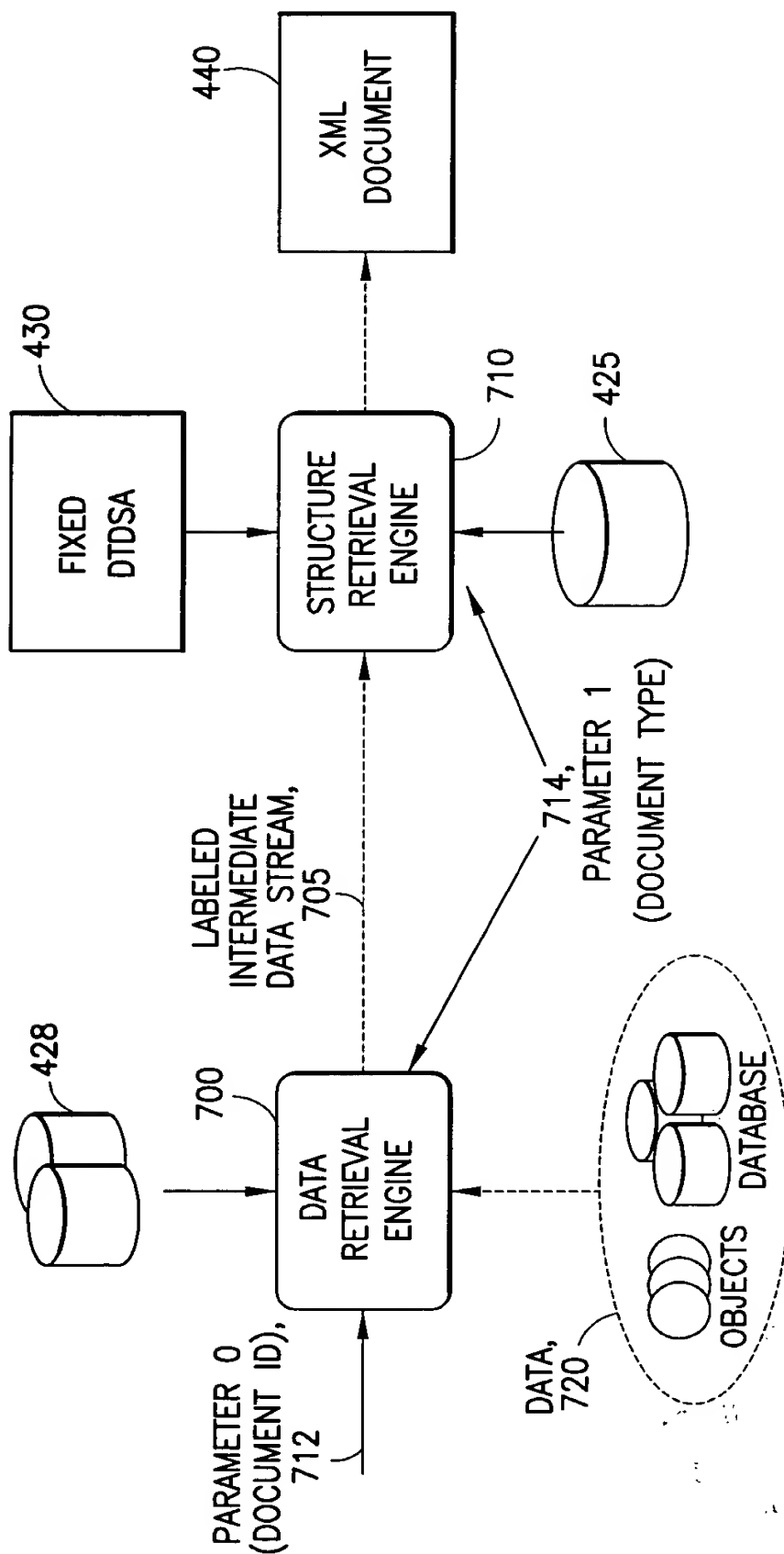


FIG. 7A

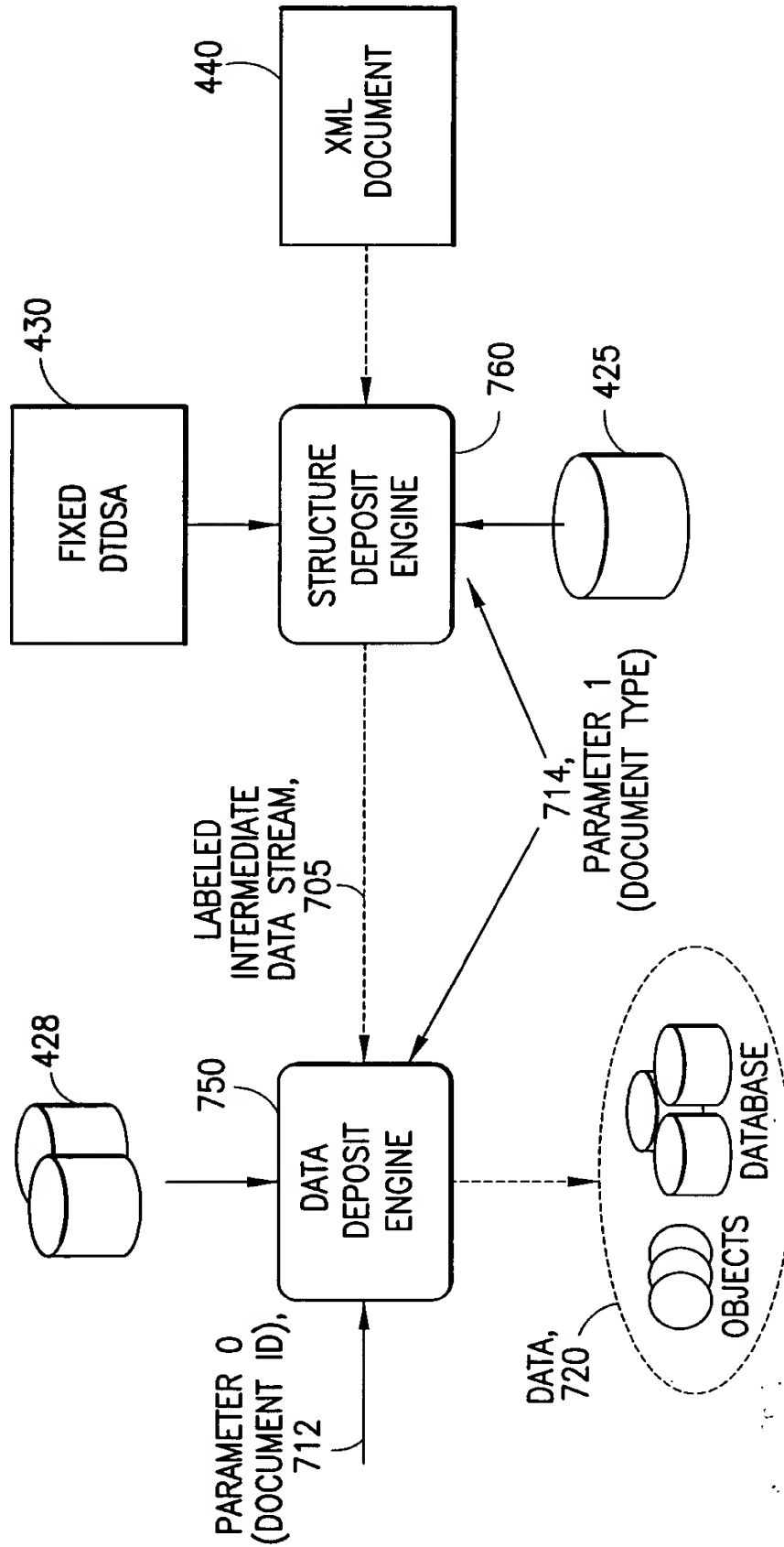
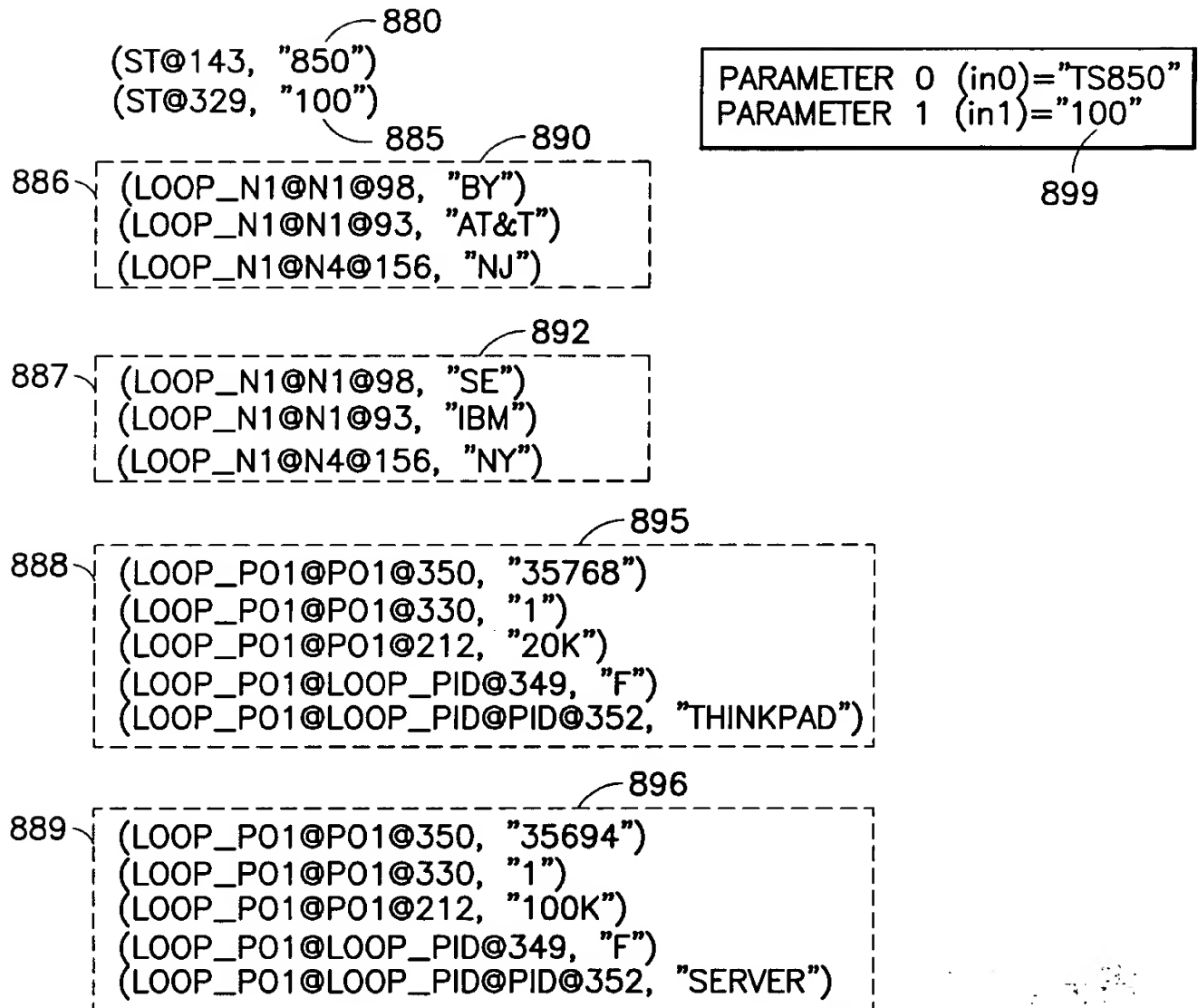


FIG. 7B

| | | | |
|----------|--------|----------|-----------|
| PO | POID | BUYER | SELLER |
| | 100 | 20 | 10 |
| | | | |
| 805 | | | |
| COMPANY | COID | NAME | ADDR |
| | 10 | IBM | NY |
| | 20 | AT&T | NJ |
| 810 | | | |
| LINEITEM | POID | PRODID | AMOUNT |
| | 100 | 35678 | 20K |
| | 100 | 35694 | 100K |
| 815 | | | |
| PRODUCT | PRODID | NAME | DESC |
| | 35678 | THINKPAD | WITH CASE |
| | 35694 | SERVER | TOWER |
| 820 | | | |

FIG.8A




```
<transactionSet code='850' version='004010' standard='X12'>
<name>Purchase Order</name>

<segment code='ST'>
  for header — 800
</segment>
<loop code='N1'>
  for buyer — 802
</loop>
<loop code='N1'>
  for seller — 804
</loop>
<loop code='P01'>
  first line item — 806
</loop>
<loop code='P01'>
  second line item — 808
</loop>
</transactionSet>
```

FIG.8C

```
<segment code='ST'>
  <name>Transaction Set Header</name>
  <element code='143'>
    <name>ID Code</name>
    <value code='850'>X12Purchase Order</value>
  </element>
  </element code='329'>
    <name>Control Number</name>
    <value>100</value>
  </element>
</segment>
```

800

FIG.9A

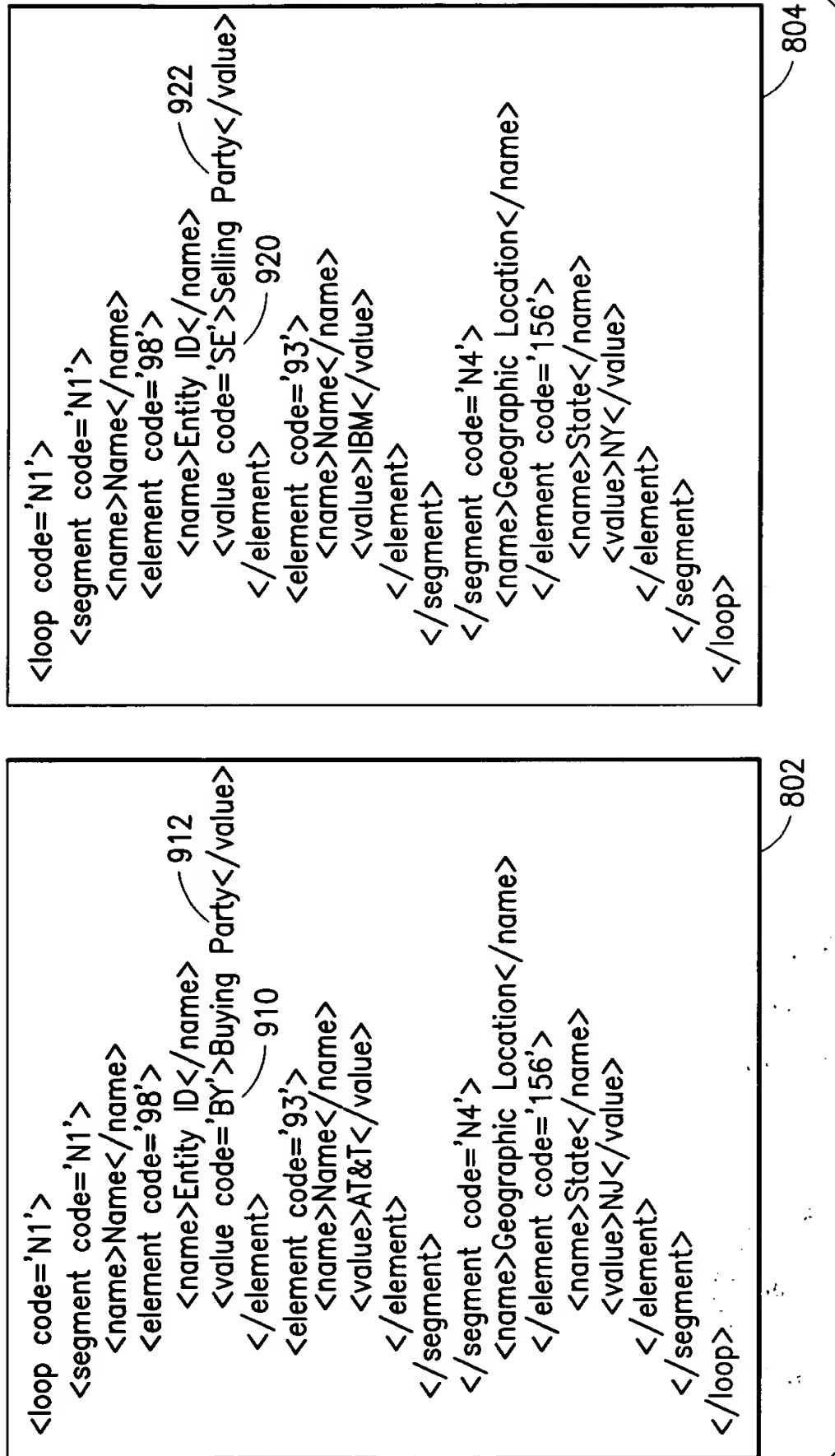


FIG.9C-1

```

<loop code='P01'>
  <segment code='P01'>
    <name>Base Line Item</name>
    <element code='350'>
      <name>ID</name>
      <value>35768</value>
    </element>
    <element code='330'>
      <name>Quantity</name>
      <value>1</value>
    </element>
    </element code='212'>
      <name>Unit Price</name>
      <value>20K</value>
    </element>
  </segment>

```

```

<loop code='P01'>
  <segment code='P01'>
    <name>Base Line Item</name>
    <element code='350'>
      <name>ID</name>
      <value>35694</value>
    </element>
    <element code='330'>
      <name>Quantity</name>
      <value>1</value>
    </element>
    </element code='212'>
      <name>Unit Price</name>
      <value>100K</value>
    </element>
  </segment>

```

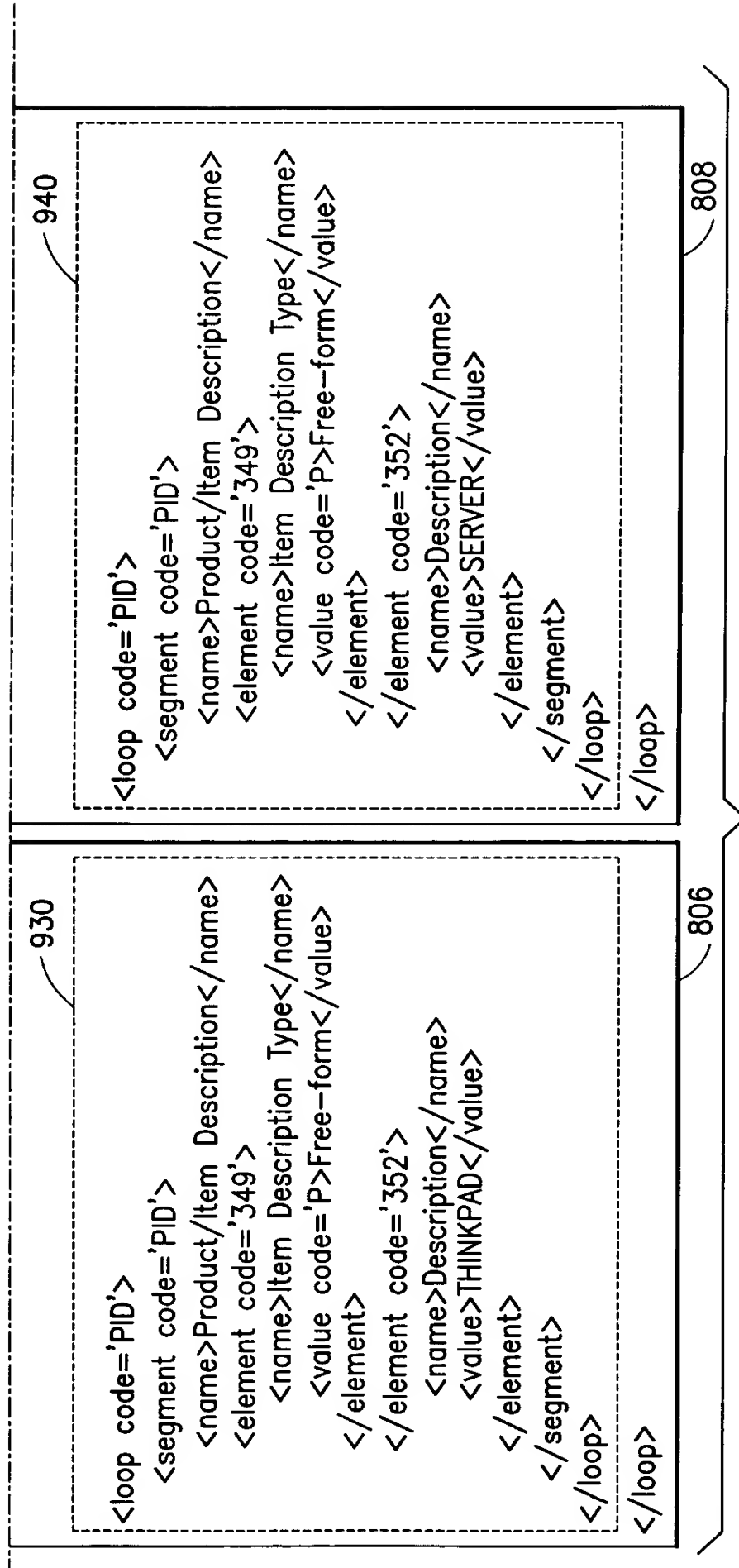


FIG.9C-2

| |
|----------|
| FIG.9C-1 |
| FIG.9C-2 |

FIG.9C

1020 <!DOCTYPE BUYERS [
1021 <!ELEMENT BUYERS(buyer)* ::r:=row (buyers)>
1022 <!ELEMENT buyer (ID, name, address, itemname, buyDate)>
1023 :: x:=row(company, <coid>, <field(buyers, buyerid, r)>)
1024 <!ELEMENT ID(#PCDATA: field(buyers, buyerid, r))>
1025 <!ELEMENT name(#PCDATA: field(company, name, x))>
1026 <!ELEMENT address(#PCDATA: field(company, addr, x))>
1027 <!ELEMENT itemname(#PCDATA: field(buyers, itemname, r))>
1028 <!ELEMENT buyDate(#PCDATA: field(buyers, buyday, r))>
1029]>

FIG.10A

```
<BUYERS>
  {
    <buyer>
      {
        <ID>1</ID> 1055
        <name>IBM</name> 1056
        <address>NY</address> 1057
        <itemname>copy machine</itemname> 1058
        <buyDate>07/04/2000</buyDate> 1059
      }
    }
  }
  {
    <buyer>
      {
        <ID>2</ID>
        <name>HP</name>
        <address>CA</address>
        <itemname>smart card</itemname>
        <buyDate>12/25/2000</buyDate>
      }
    }
  }
</BUYERS>
```

FIG.10B

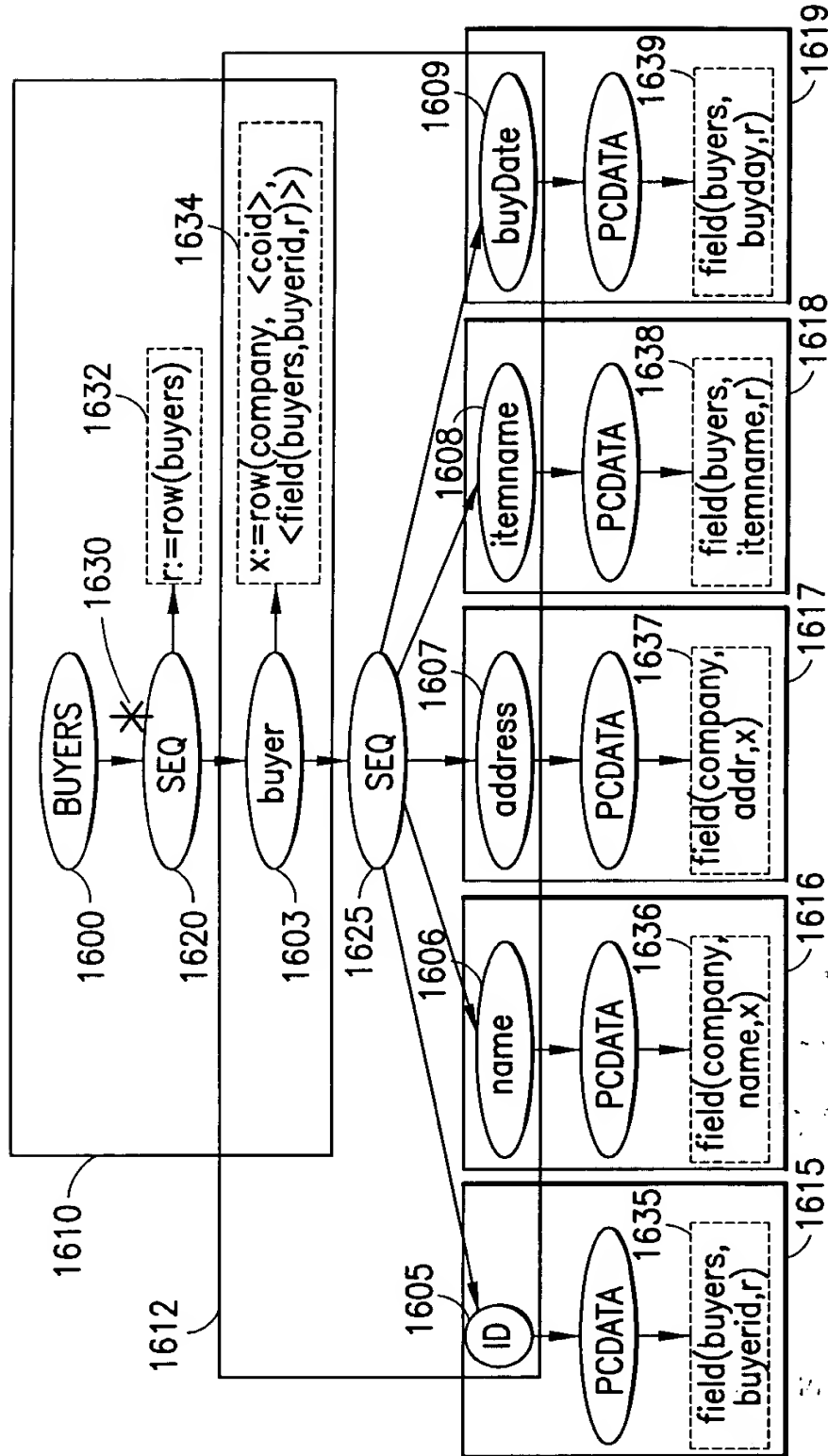


FIG. 11A

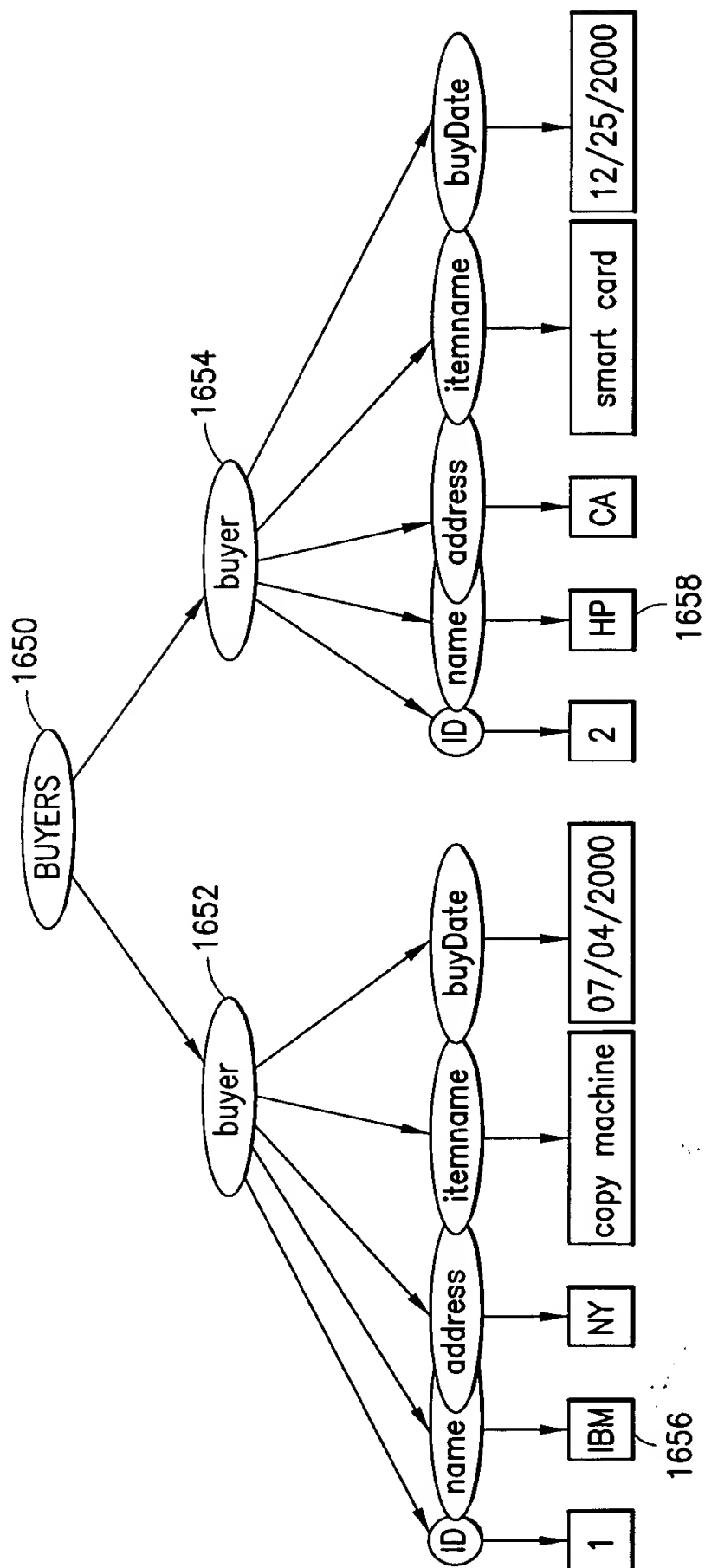


FIG. 11B

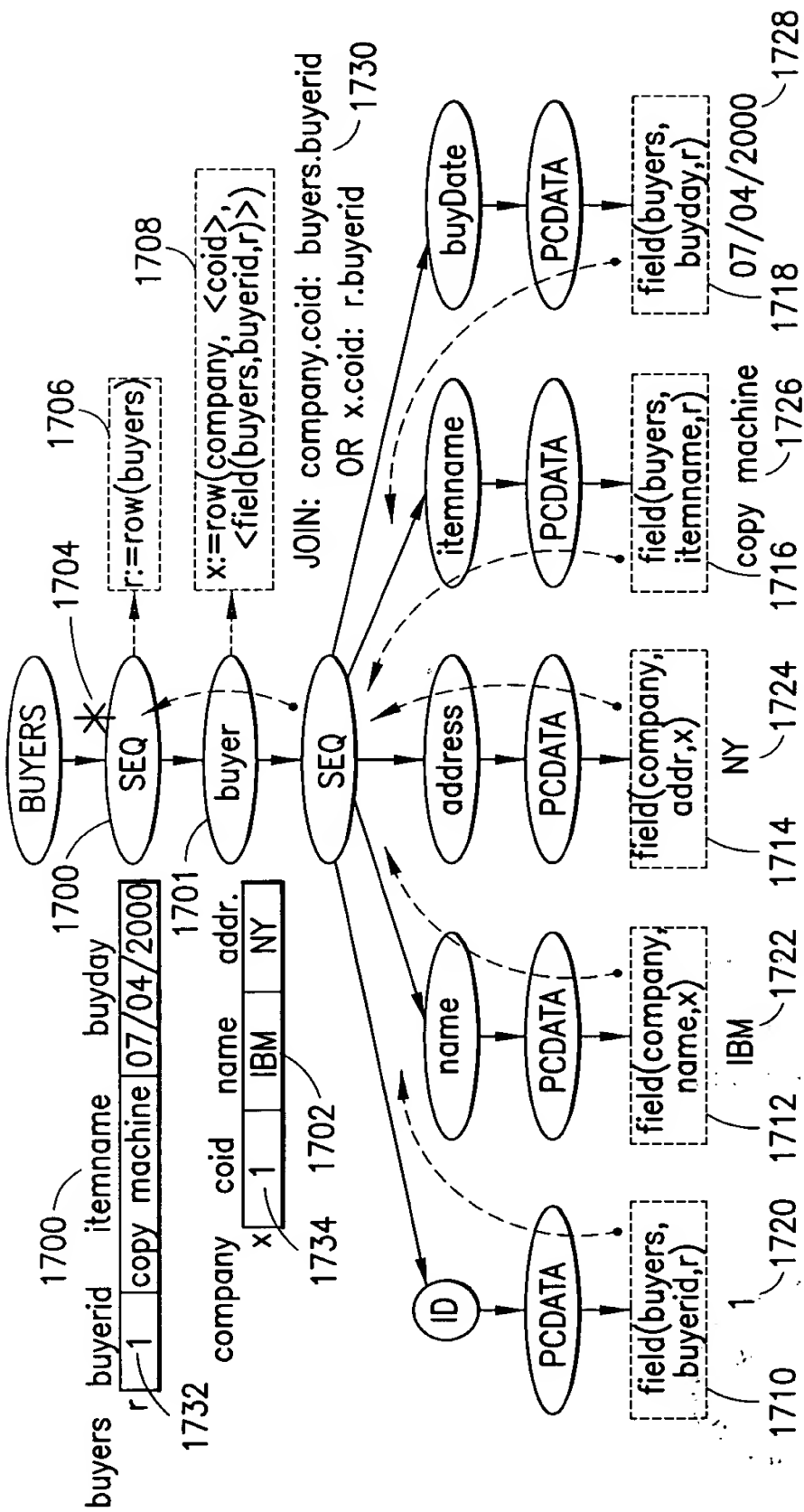


FIG.12A

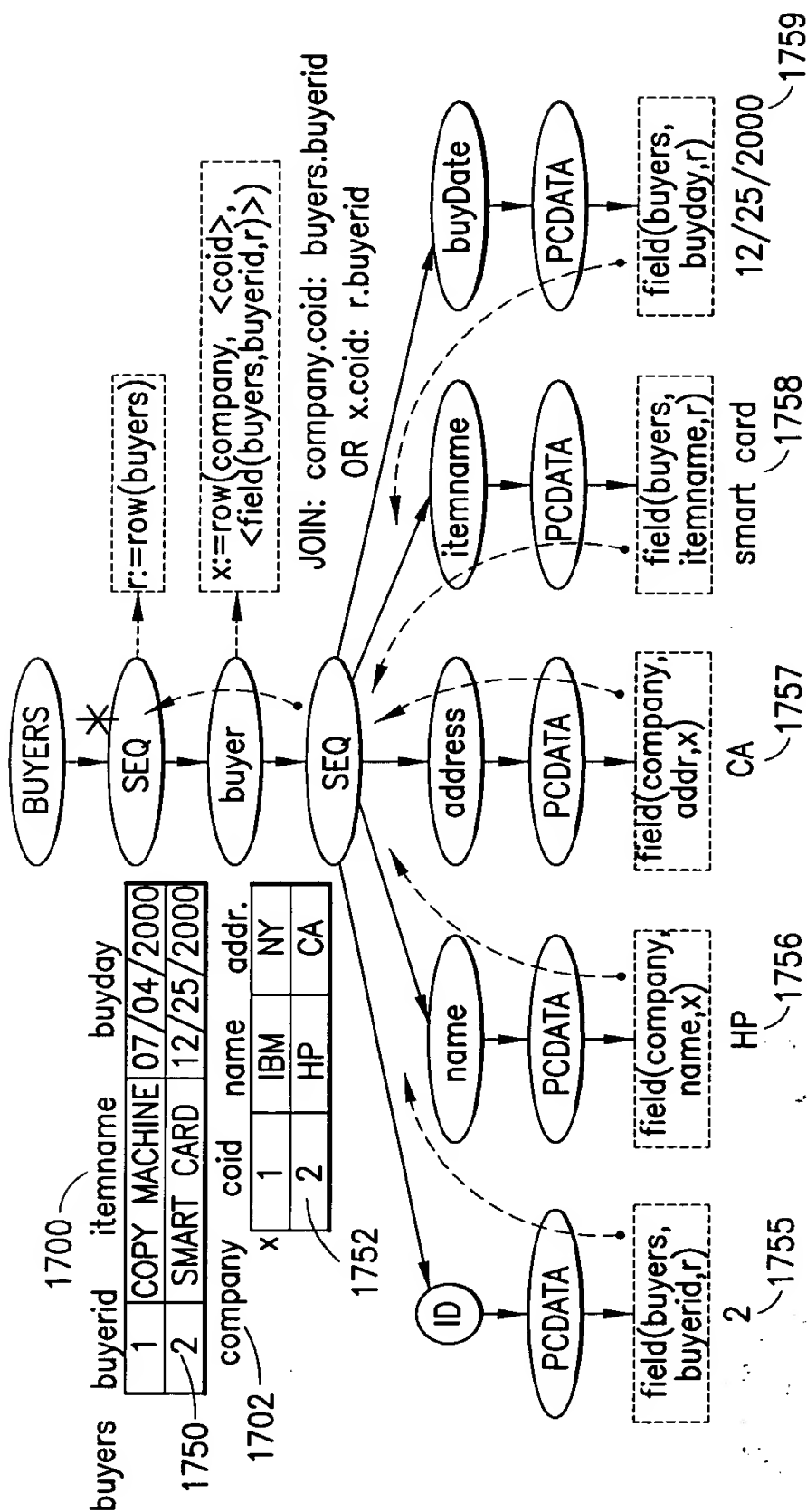


FIG.12B

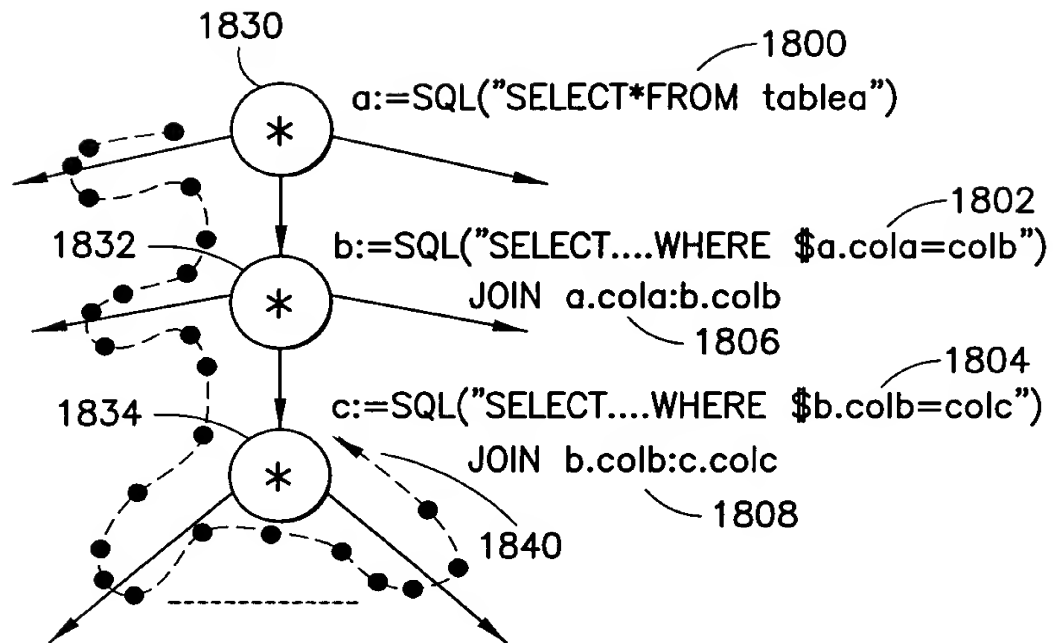


FIG.13

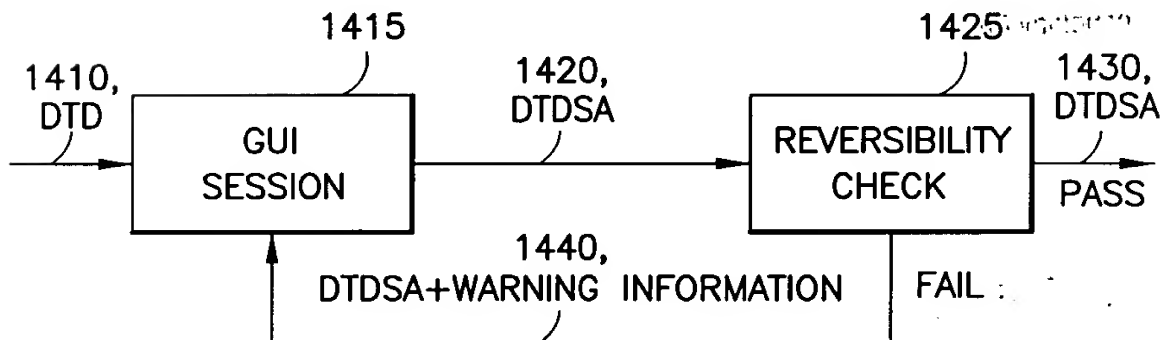


FIG.14